
**Raising the Second Pier of the Dome of the Palais des Beaux-Arts**
Paris, in Société des Ponts et Travaux en Fer, *Exposition Universelle 1889 Domes des Palais des Beaux-Arts et des Arts Libéraux*, 1889

# documentary photography, temporality, and the industrialization of the parisian worksite

**Sean Weiss**
Assistant Professor, City College of New York, Spitzer School of Architecture,
sweiss@ccny.cuny.edu

*Architectural media operate at different speeds. This fact was evident to the French engineers who routinely documented the construction of industrial buildings and infrastructure with photography in Paris during the late nineteenth century. In this period, French engineers principally worked as managers, as the industrialization of the Parisian worksite emerged in concert with preoccupations about oversight and supervision. Such concerns had surfaced with changing conceptions of time under industrial capitalism as exemplified by the standardization of timekeeping after 1884 that was necessitated by new technologies such as the telegraph and the railroad. Working under new regimes of time, engineers consistently commissioned serial photographs of the construction process taken at timed intervals. Such images visualized and verified the expediency and efficiency of labor, building materials, and methods of construction within the expanding bureaucracy of the state's administrations for building. This paper contends that construction photographs, as they clocked the phases of construction, played a supportive role in the production of engineering knowledge at a moment when engineers operated according to a managerial paradigm. Accordingly, construction photographs participated in a broader cultural field, contributing to the industrialization of the worksite and of time itself in the wake of the expansion of urban capitalism during the second half of the nineteenth century.*

**keywords** Construction photography, Nineteenth century, Paris

## introduction

Architectural media operate at different speeds. This fact was evident to the French engineers who routinely documented the construction of industrial buildings and infrastructure with photography in Paris during the late nineteenth century. In this period, French engineers principally worked as managers, as the industrialization of the Parisian worksite emerged in concert with preoccupations about oversight and supervision. Such concerns had surfaced with changing conceptions of time under industrial capitalism – what Stephen Kern calls "the culture of time"– as exemplified by the standardization of timekeeping after 1884 that was necessitated by new technologies such as the telegraph and the railroad[1]. Working under new regimes of time, engineers consistently commissioned serial photographs of the construction process taken at timed intervals: sometimes over the course of months, sometimes over the course of hours. Such images visualized and verified the expediency and efficiency of labor, building materials, and methods of construction within the expanding bureaucracy of the state's administrations for building. While older graphic techniques could provide similar forms of information, as could written site reports, they did so with less instantaneity and immediacy. Furthermore, while scholars have often underscored that architecture's static quality was well suited to the long exposure times of early photography, this point belies the medium's other temporal dimensions, as serial photographs were capable of visualizing the sequential and progressive changes of the construction process. While documentary photography has been called a "witness" of engineering, this paper contends that construction photographs, as they clocked the phases of construction, played a supportive role in the production of engineering knowledge at a moment when engineers operated according to a managerial paradigm[2]. Accordingly, construction photographs participated in a broader cultural field, contributing to the industrialization of the worksite and of time itself in the wake of the expansion of urban capitalism during the second half of the nineteenth century.

## photography and the image of time

Conceptions of temporality in the period are inextricably associated with the work of Eadweard Muybridge. In 1872, Muybridge began to experiment with visualizing time by tracking human and nonhuman animal locomotion in serial photographs **(f1)**. His twenty sequential images of a galloping horse, for example, register the animal's discrete movements to create a unidirectional visual narrative unfolding within a sequence that Hollis Frampton describes as "a uniform grid of Cartesian coordinates"[3]. The influence of Muybridge's photographs was formidable and notably prompted the Parisian physiologist Étienne-Jules Marey to study even faster forms of bodily motion by developing methods for visualizing temporal movements through multiple exposures on a single photographic plate. Despite their differing approaches, both photographers subjected bodily movement to a series of rationalizations that were calibrated by new conceptions of time[4].

In the wake of these experiments, construction photography would become rife with similar serial images tracking the construction process; however, the human body would be completely absent from such photographs, as if building an exposition hall or skyscraper was an entirely mechanized process. The most celebrated example is surely Théophile Féau's collection of sequential photographs –taken at monthly intervals from 1887 to 1889– to document the vertical construction of the Eiffel Tower **(f2)**, the centerpiece of the Universal Exposition of 1889 that feted the centennial of the French Revolution. In each photograph, Féau captured the building from the same vantage point –the Trocadéro across the Seine River from the tower on the Champ de Mars. From a distance, the frame would be able to accommodate the soaring 300-meter structure upon its completion. The photographs condense the duration of the construction process into a series of images

similar to Muybridge's photographs. In Féau's images, the iron edifice shoots further upward in each subsequent image, forging a synoptic visual account of the structure's vertical development that also depended on a reciprocal relationship between image and text, as each photograph bears the written date of the photograph's execution. Moreover, Féau's totalizing account of the tower only became perceptible upon the structure's completion, when the series of photographs could be ordered into a coherent visual narrative that coalesced space and time, as the spectacle of the tower's unprecedented height emerges in concert with its rapid construction time. By doing so, the photographs contributed to the ideologies of progress associated with the Third Republic's political aspirations at the Universal Exposition of 1889 more broadly[5]. And yet, the photographs provide a generalized, aesthetic means of representing the tower's construction. Féau's photographs thus communicate very little information about the tower that was of use to its builders. Instead, it would be Émile Durandelle, the official photographer of the Eiffel Tower's construction, who documented the construction process in far greater detail. Durandelle's photographs interleave close-ups of the worksite that depict major moments of construction with images taken from a distance to track the structure's vertical development, in a manner similar to Féau's photographs, only shot from the south with the Trocadéro in the background. Durandelle's photographs, however, include representations of workers that Féau had omitted in order to visualize the construction process as if it were a purely mechanistic feat.

**f1_Galloping**
1875-1881, Eadweard Muybridge, J. Paul Getty Museum, Public Domain

**f2_Construction of the Eiffel Tower**
Paris, 1887-1889, Théophile Féau, Wikepdia, Public Domain

## photography and the temporalities of the construction site

For decades, photographers such as Durandelle, whose commercial studios had gained substantial commissions to document building campaigns, had customarily recorded the construction process through serial photographs. Consider, for example, Hippolyte-Auguste Collard's photographs of the construction of the bridges of Paris that span the Seine River. Beginning in 1857, the Service des Ponts et Chaussées, the state administration of engineers charged with the building campaigns, commissioned Collard, whose photographs were assembled into leather-bound albums commemorating individual bridges[6]. Although the contents of these albums vary, the organization of their photographs remains largely standard and each shares a similar visual narrative. The photographs tightly frame the individual bridges and capture their elevations at slight angles, depicting the construction process in full view within a single image[7]. Collard began by photographing the old bridge slated for demolition and then visually registered the major episodes of construction chronologically to formalize a linear model of progressive evolution, culminating in the bridge's completion, a narrative that unfolded as a reader turned the pages of the photographic albums.

On the broadest level, Collard's albums participate in new conceptions of time by visualizing the unidirectional process of construction. But Collard included additional photographs in these albums that reveal a far more precise engagement with the temporalities of industrial capitalism by depicting workers as evidence of time efficiency on the construction site. Because the long exposure time of early photography required that all figures stand posed if they were to materialize on the photographic surface, the inclusion of workers in his photographs was entirely deliberate. Among Collard's photographs of the Pont de Bercy is an image of 1864 that frames a single arch as the actors of the scene pose to commemorate the pivotal moment of decentering the arches **(f3)**. In the image, a sharp division of labor is

revealed among the figures based upon their attire. The engineers, identifiable by their black overcoats, stand nearly over the keystone in the center of the composition. Other figures –largely workmen wearing light-colored clothing, but also engineers– are distributed across the scene, perched on the extrados, sitting on scaffolding, and standing atop the piers. To understand the reasons for recording the extraordinary number of figures in this image, it is necessary to consider the mounting concerns about the management of workmen onsite.


**f3_Decentering**
Pont de Bercy, Paris, 1864. Bibliothèque nationale de France. Public Domain

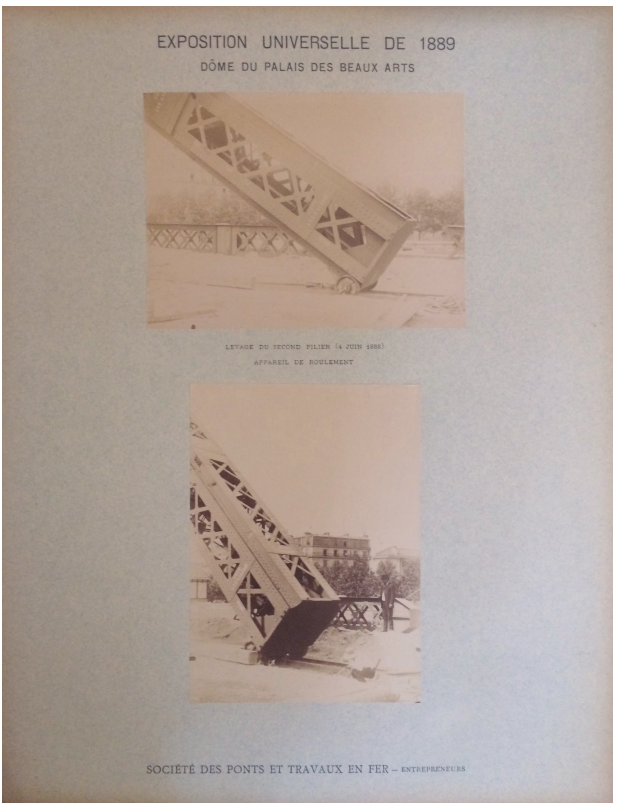
Workers began to populate Collard's photographs of bridge construction in reaction to a debate that transpired regarding the worksite in the late 1850s. In December 1857, the engineer Émile Vaudrey decentered the arches of the Pont Saint-Michel by means of small cylinders filled with sand –known as sandboxes– containing compressible walls with stoppers at their bases[8]. Workers slowly removed these stoppers to let the sand flow out of them at an even pace in order to gently disengage the centering from the new vaults of the bridge. Vaudrey, however, clashed with the inventor of the process, Louis-Alexis Beaudemoulin, in the professional press[9]. The two engineers disagreed over the number of workers required to decenter the bridge with the sandboxes and thus the time and labor efficiency of the sandboxes. Although Beaudemoulin had claimed that the process took more time and labor, Vaudrey asserted that he had decentered the vaults of the Pont Saint-Michel with only twelve workers, thereby drastically reducing the cost and time involved in overseeing the workforce.

Despite their differing opinions, Vaudrey would ultimately have the last say in the matter. Vaudrey would subsequently commission Collard to photograph the number of workers on the construction site during the decentering process as seen in the image of the Pont de Bercy. In this photograph, Collard concentrates on the decentering of a single arch as a veritable *tableau vivant* of the worksite in which the number of workers on site can be observed and verified. André Rouillé argues that Collard's photographs of bridges populated by workers, foremen, and engineers disclose the "social space of the worksite"[10]. Vaudrey exploits photography as a means to objectively document the labor involved in the decentering process; this "world of work" is rendered according to the rational and hierarchical strictures of efficiency and management –"the forces governing the organization" of the figures in these images.

Accordingly, the photograph communicates information about the construction process that surpasses mere technical documentation. Anthony Giddens reminds us that in industrial capitalism "time –as a quantified form– becomes fundamental to the intersection of class relations within the labour-process"[11]. The photograph thus visualizes the "commodification of space-time" in construction, not only to record the progress of bridge construction but also to visualize and confirm the labor invested in that process. As Collard's images picture workers, they render human labor synchronous with the duration of the construction process. Thus, industrialized labor, which accelerates productivity by means of stricter control of the worksite (at least, in this instance), transforms the workers in these images, as André Gorz underscores more broadly, "into appendages of the megamachines of capital"[12]. Ultimately, engineers mobilized photography –at least conceptually– as a means to regulate and verify labor by imposing a visual and, indeed, virtual system of management in lieu of one in real time. This method superseded the vicissitudes of verbal and written communication by using ostensibly objective images of managerial oversight and control. In this regard, these photographs contribute to the steady stream of paperwork that circulated through the bureaucratic channels of state building, including the burgeoning of construction documents, as Barbara Shapiro-Comte argues[13].

## exchanges between photography and drawing

In their photographs, Collard and Féau each conceptualize temporality in distinct ways. On the one hand, Féau's photographs furnish an aestheticized vision of the construction progress and its temporal duration through serial images. On the other hand, Collard's images of workers disclose the temporal dimensions of the efficiencies of labor and building techniques in a single photograph. Situated between these two poles is a photographic album commissioned by the Société des Ponts et Travaux en Fer, the private company that built the iron frame for the domes for the Palais des Beaux-Arts and the Palais des Arts Libéraux at the Universal Exposition of 1889. The album, whose images were shot by a photographer no longer known to us today, includes a series of photographs taken at timed intervals that depict the erection of a vertical iron pier of the Palais des Beaux-Arts. These serial photographs illustrate the process whereby the pier, initially laid horizontally on the ground, is gradually raised and positioned into place to support the dome above by means of a mechanized rolling apparatus **(f4)**. Like Féau's serial images, the photographs verify the expediency of the construction process, only over the course of a few hours instead of months. Like Collard's image, the photographs also visualize and track the temporal efficiency of the construction method used to erect the pier. Here, then, time is represented and rationalized both through serial images and the visualization of construction efficiency. To do so, the sequential images yoke this act of temporal rationalization to photomechanical representation and reproduction, especially as they were understood in the nineteenth century.




**f4_Raising the Second Pier of the Dome of the Palais des Beaux-Arts**
Paris, in Société des Ponts et Travaux en Fer, *Exposition Universelle 1889 Domes des Palais des Beaux-Arts et des Arts Libéraux*, 1889. Public Domain

Engineers had conceived of photographs as an extension of technical drawings with the capacity to render the engineer's labor all the more efficient. This point was underscored by the photographer Lucien Bordet who instructed engineering students in the medium at the École des Ponts et Chaussées, France's centralized state school of civil engineering, from 1886 to 1904. Bordet expounded:

> *In industry, in the art of the engineer, the drawing plays the role of a veritable language; if the hand of man were the only means to carry out all their work, there would be an extremely considerable expenditure of time and money. Photographic procedures permit them to obtain a number of copies quickly and at a good price*[14].

Bordet's claim that the photograph furnished a proxy for the drawing incited aspirations about the new medium's capacity as a labor-saving device. This assumption had appeared in the earliest discussions of the medium in France, notably including François Arago's celebrated announcement of the daguerreotype's invention in 1839[15]. Moreover, Bordet extended widely held conceptions of the drawing to the contemporary understanding of the photograph. After Gaspard Monge developed descriptive geometry at the end of the eighteenth century, French engineers began to privilege various forms of parallel projection, a trend that continued over the course of the nineteenth century. Descriptive geometry was associated with the aspirations of Enlightenment social philosophy and the French Revolution that sought to ease the labor of the worker, as it furnished the foundations for a new, democratized technical language to be disseminated through universal education[16]. Descriptive geometry provided a ground upon which engineers transformed the technical drawing into a quasi-mechanized process that subordinated the contingencies of the hand's movement to the protocols of a predetermined logic. The two-dimensional page not only provided the plane off of which engineers could project structures into space, it also served as a mechanism to gauge the translation of that projection into built form according to the *idées fixes* of quantification –thereby tightening the relationship between the conception and realization of a project and contributing to engineering's managerial paradigm in the nineteenth century[17].

In many respects, the serial photographs from the album commissioned by the Société des Ponts et Travaux en Fer depict the erection of the pier as a quasi mechanical process. Although the photographs do not do the same work as descriptive geometry, they submit the construction process to the temporal and spatial requirements of a project using a similar logic, albeit in a purely visual manner. As Antoine Picon and Joel Sakarovitch both argue, descriptive geometry never proved to be very effective in the design of buildings or machines. As Picon writes, its instruction "had more to do with the mental habits of order and precision than it tended to establish"[18]. Due to the medium's ability to capture depth of field, photography is adroit at simulating perspective. Indeed, concurrent experiments in photogrammetry that engaged the medium to survey buildings and landscapes evidence photography's potential association with perspective[19]. As an abstract graphic method, however, descriptive geometry is not inherently illustrated in the composition of a photograph. Nevertheless, the serial photographs of the pier emerge from the graphic conventions of engineering, which served as an epistemological foundation for the discipline. Thus, the velocities of photography, at least as engineers used it, developed out of the temporal conceptions offered by descriptive geometry and operated at the speed of other forms of paperwork. Accordingly these photographs became part of the paper trail of documents –or, what Bruno Latour calls "inscriptions"– that also included construction and technical drawings, models, maps, cost estimates, and calculations[20]. Taken together, these documents accumulated over the course of the design and construction process as part of an attempt to tighten managerial control over building projects.

## conclusion

The photographic practices considered here have raised a series of interrelated issues concerning photography's capacity to track time on the construction site. If Féau's serial photographs of the Eiffel Tower furnished striking images of the structure's vertical development, they did so at the cost of providing more specific information about the construction process to the tower's builders. For engineers, photographic documentation provided one means of visualizing and thus verifying the efficiency of the worksite, a concern that became especially relevant in light of new conceptions of time under industrial capitalism. In engineers' early use of photography to record the construction of bridges in Paris, Collard's most precise depiction of the temporal dimensions of the worksite

emerged in photographs that illustrated the organization of labor. Such images served as a means to verify the efficiency of workmen in handling new building technologies. Féau and Collard's distinct ways of picturing time would be reconciled in the photographic album illustrating the erection of piers for the Palais de Beaux-Arts at the Universal Exposition of 1889. By registering the process of raising the pier in sequential photographs, these images participated in conceptions of time that had been developed in other graphic techniques. Therefore, the temporal characteristics of photography seemed to mirror the velocities of drawing, as conceptualized by engineers in the period. Taken collectively, these applications of photography would create visual narratives of progressive evolution and helped thrust building into a state of presentism that, as discussed by Marvin Trachtenburg, has defined building culture more broadly, especially since the Industrial Revolution[21]. One possible genealogy of this phenomenon surely lies in the photographic practices of engineers in the late nineteenth century, since they marshaled the medium as part of the rationalization of the worksite during an age of urban capitalism.

## endnotes

1. Stephen Kern, *The Culture of Time and Space, 1880-1914* (Cambridge: Harvard University Press, 1983).

2. Ralph Greenhill, *Engineer's Witness* (Toronto: Coach House Press, 1985).

3. Hollis Frampton, "Eadweard Muybridge: Fragments of a Tesseract", *Artforum* (March 1973): 46.

4. John Ott, "Iron Horses: Leland Stanford, Eadweard Muybridge, and the Industrialized Eye", *Oxford Art Journal* 28, no. 3 (2005): 409-428; and Marta Braun, *Picturing Time: The Work of Étienne-Jules Marey (1830-1904)* (Chicago: University of Chicago Press, 1994).

5. Harry Paul, *From Knowledge to Power: The Rise of the Science Empire in France, 1860-1939* (Cambridge: Cambridge University Press, 1985); Miriam Levin, *Republican Art and Ideology in Late Nineteenth-Century France* (Ann Arbor: UMI Research Press, 1986); and Debora Silverman, "The 1889 Exposition: The Crisis of Bourgeois Individualism", *Oppositions* 8 (Spring 1977): 71-92.

6. On Collard, see Elizabeth Anne McCauley, *Industrial Madness: Commercial Photography in Paris, 1848-1871* (New Haven: Yale University Press, 1994), 202-232; Isabelle-Cécile Le Mée, "Hippolyte-Auguste Collard, photographe d'architectures", in *Du réel au simulacre. Cinéma, photographie et histoire*, eds. Frédéric Delmeulle, Stéphane Dubreil, and Thierry Lefebvre (Paris: L'Harmattan, 1993), 43-70; and Isabelle-Cécile Le Mée, "Collard, photographe des Ponts et Chaussées", *Histoire de l'art* 13/14 (May 1989): 31-45. On the building campaigns of the bridges of Paris, see Charles Duplomb, *Histoire générale des ponts de Paris* (Paris: Imprimerie de J. Mersch, 1911); Jocelyne van Deputte, *Ponts de Paris* (Paris: Editions Sauret, 1994); and M. Féline Romany, "Notice historique sur les ponts de Paris", *Annales des Ponts et Chaussées* 4, no. 2 (1864): 127-224.

7. Engineers requested that Collard photograph the bridges in elevation from the quays along the Seine. See Émile Vaudrey to Auguste-Hyppolyte Collard, 17 February 1876, file 449, Correspondence of Hippolyte Collard, Lucien Descaves Papers, International Institute of Social History, Amsterdam.

8. M. Vaudrey "Décintrement et fondation du pont Saint-Michel", *Annales des Ponts et Chaussées* 3, no. 2 (1859): 114-118; M. Beaudemoulin, "Sur l'emploi du sable dans les décintriments", *Annales des Ponts et Chaussées* 3, no. 2 (1854): 206-216; and M. Beaudemoulin, "Décintrement des arches de pont au moyen du sable; perfectionnements", *Annales des Ponts et Chaussées* 3, no. 2 (1857): 222-237.

9. Vaudrey, "Décintrement", 114.

10. André Rouillé, "Les images photographiques du monde du travail sous le Second Empire", *Actes de la recherche en science sociales* 54 (September 1984): 31-43.

11. Anthony Giddens, "Modernism and Postmodernism", *New German Critique* 22 (Winter 1981): 15-18.

12. André Gorz, *Ecologica*, trans. Chris Turner (London: Seagull Books, 2010), 29.

13. Barbara Shapiro Comte, "King's Feet to Republican Metres: The Evolution of Construction Drawings, Paris, 1782-1876", in *The Proceedings of the Fifth International Congress on Construction History*, ed. Donald Friedman. Raleigh: Lulu Press, 2015, 281-292.

14. Lucien Bordet, *Conférences sur la photographie* (Paris: École des Ponts et Chaussées, 1888), 3.

15. François Arago, "Rapport à la Chambre des deputés", in *La Photographie en France. Textes et controverses. Une Anthologie, 1816-1871*, ed. André Rouillé (Paris: Macula, 1989), 36-42.

16. The suppression of the guilds sought to undo the traditional master-apprentice model of learning. Allan Potofsky, "The Construction of Paris and the Crises of the Ancien Régime: The Police and the People of the Parisian Building Sites, 1750-1789", *French Historical Studies* 27, no. 1 (Winter 2004): 9-48.

17. Alberto Pérez-Gomez, "Architecture as Drawing", *JAE* 2 (Winter 1982): 3.

18. Antoine Picon, "From 'Poetry of Art' to Method: The Theory of Jean-Nicolas-Louis Durand", in J.N.L. Durand, *Précis of the Lectures on Architecture: With Graphic Portion of the Lectures on Architecture* (Los Angeles: Getty Publications, 2000), 27; and Joel Sakarovitch, *Epures d'architecture: De la coupe des pierres à la géométrie descriptive, XVI - XIX siècles* (Basel: Birkhäuser, 1998), 347.

19. Aimé Laussedat, *Recherches sur les instruments, les méthodes et le dessin topographique*. 2 vols (Paris: Gauthier-Villars, 1898-1903).

20. Bruno Latour, "Visualization and Cognition: Thinking with Eyes and Hands", *Knowledge and Society* 6 (1986): 24-26.

21. Marvin Trachtenburg discusses architecture's presentism in terms of what he calls "modern oblivion". See Marvin Trachtenburg, *Building-in-Time: From Giotto to Alberti and Modern Oblivion* (New Haven: Yale University Press, 2010).

## bibliography

_Arago, François. "Rapport à la Chambre des deputes". In *La Photographie en France. Textes et controverses. Une Anthologie, 1816-1871*, edited by André Rouillé, 36-42. Paris: Macula, 1989.

_Beaudemoulin. "Décintrement des arches de pont au moyen du sable; perfectionnements", *Annales des Ponts et Chaussées* 3, no. 2 (1857): 222-237.

_"Sur l'emploi du sable dans les décintriments", *Annales des Ponts et Chaussées* 3, no. 2 (1854): 206-216.

_Bordet, Lucien. *Conférences sur la photographie*. Paris: École des Ponts et Chaussées, 1888.

_Braun, Marta. *Picturing Time: The Work of Étienne-Jules Marey (1830-1904)*. Chicago: University of Chicago Press, 1994.

_Van Deputte, Jocelyne. *Ponts de Paris*. Paris: Editions Sauret, 1994.

_Duplomb, Charles. *Histoire générale des ponts de Paris*. Paris: Imprimerie de J. Mersch, 1911.

_Frampton, Hollis. "Eadweard Muybridge: Fragments of a Tesseract", *Artforum* 11 (March 1973): 43-52.

_Giddens, Anthony. "Modernism and Postmodernism", *New German Critique* 22 (Winter 1981): 15-18.

_Gorz, André. *Ecologica*, translated by Chris Turner. London: Seagull Books, 2010.

_Ralph Greenhill, *Engineer's Witness*. Toronto: Coach House Press, 1985.

_Kern, Stephen. *The Culture of Time and Space, 1880-1914*. Cambridge: Harvard University Press, 1983.

_Latour, Bruno. "Visualization and Cognition: Thinking with Eyes and Hands", *Knowledge and Society* 6 (1986): 1-40.

_Laussedat, Aimé. *Recherches sur les instruments, les méthodes et le dessin topographique*. 2 vols. Paris: Gauthier-Villars, 1898-1903.

_Levin, Miriam. *Republican Art and Ideology in Late Nineteenth-Century France*. Ann Arbor: UMI Research Press, 1986.

_McCauley, Elizabeth Anne. *Industrial Madness: Commercial Photography in Paris, 1848-1871*. New Haven: Yale University Press, 1994.

_Le Mée, Isabelle-Cécile. "Hippolyte-Auguste Collard, photographe d'architectures". In *Du réel au simulacre. Cinéma, photographie et histoire*, edited by Frédéric Delmeulle, Stéphane Dubreil, and Thierry Lefebvre, 43-70. Paris: L'Harmattan, 1993.

_"Collard, photographe des Ponts et Chaussées", *Histoire de l'art* 13/14 (May 1989): 31-45.

_Ott, John. "Iron Horses: Leland Stanford, Eadweard Muybridge, and the Industrialized Eye", *Oxford Art Journal* 28, no. 3 (2005): 409-428.

_Paul, Harry. *From Knowledge to Power: The Rise of the Science Empire in France, 1860-1939*. Cambridge: Cambridge University Press, 1985.

_Pérez-Gomez, Alberto. "Architecture as Drawing", *JAE* 2 (Winter 1982): 3.

_Picon, Antoine. "From 'Poetry of Art' to Method: The Theory of Jean-Nicolas-Louis Durand". In J.N.L. Durand, *Précis of the Lectures on Architecture: With Graphic Portion of the Lectures on Architecture*, 1-68. Los Angeles: Getty Publications, 2000.

_Potofsky, Allan. "The Construction of Paris and the Crises of the Ancien Régime: The Police and the People of the Parisian Building Sites, 1750-1789", *French Historical Studies* 27, no. 1 (Winter 2004): 9-48.

_Romany, Féline. "Notice historique sur les ponts de Paris", *Annales des Ponts et Chaussées* 4, no. 2 (1864): 127-224.

_Rouillé, André. "Les images photographiques du monde du travail sous le Second Empire", *Actes de la recherche en science sociales* 54 (September 1984): 31-43.

_Sakarovitch, Joel. *Epures d'architecture: De la coupe des pierres à la géométrie descriptive, XVI - XIX siècles*. Basel: Birkhäuser, 1998.

_Shapiro Comte, Barbara. "King's Feet to Republican Metres: The Evolution of Construction Drawings, Paris, 1782-1876". In *The Proceedings of the Fifth International Congress on Construction History*, edited by Donald Friedman, 281-292. Raleigh: Lulu Press, 2015.

_Silverman, Debora. "The 1889 Exposition: The Crisis of Bourgeois Individualism", *Oppositions* 8 (Spring 1977): 71-92.

_Trachtenburg, Marvin. *Building-in-Time: From Giotto to Alberti and Modern Oblivion*. New Haven: Yale University Press, 2010.

_Vaudrey. "Décintrement et fondation du pont Saint-Michel", *Annales des Ponts et Chaussées* 3, no. 2 (1859): 114-118.

**CV**

**Sean Weiss.** Sean Weiss is Assistant Professor of Architectural History at the Bernard and Anne Spitzer School of Architecture at the City College of New York. He holds a Ph.D. in the History of Art from the Graduate Center of the City University of New York. His articles and reviews have appeared in journals such as *Casabella*, *The Journal of Architectural Education*, and *Log*. He is preparing a book manuscript on the photographic practices of engineers in Paris from 1857 to 1911.